M.P.E.P. §§ 707.07(a) and (g). The latest rejection, as noted herein, involves a largely irrelevant reference and was unnecessary as all of the claims are in condition for allowance.

Applicants acknowledge the Examiner's indication of allowability of claims 20, 22, and 23 in Paper No. 13. However, the Examiner now rejects claims 1, 2, 11, 12 and 19 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,067,189 of Gillich ("Gillich"). The Examiner argues that Gillich teaches an aluminum reflector with a composite reflectivity-enhancing surface layer having an outer layer, a HI (high refractive index) layer and an LI (low refractive index) layer. The HI layer is allegedly a sol-gel layer which may be composed of niobium oxide. The Examiner contends that the object of the invention of Gillich is to reduce cost by depositing the HI layer as a sol-gel HI layer, which also assertedly exhibits good resistance to scratching and good formability, and that it is possible to optimize these properties by the choice of composition of the sol-gel layer. Finally, the Examiner asserts, without support, that a film of niobium oxide would inherently possess the claimed index of refraction.

Regarding claims 12 and 19, the Examiner further argues that the LI layer is a sol-gel layer that may comprise a mixture of silicon oxide, aluminum oxide, and an oxide of a transition metal (Nb). The Examiner acknowledges that Gillich does not specifically teach the refractive index of such a layer, but teaches that an exemplary LI layer has a refractive index of 1.55-1.65. Therefore, the Examiner concludes that the LI layers of Gillich would approximate these values and that the HI layer would have a greater refractive index. For all of these reasons, the Examiner contends that the layers taught by Gillich meet the structural limitations of the instant claims and would inherently possess the claimed characteristics. Applicants respectfully traverse the rejection and the arguments in support thereof for the reasons set forth below, and respectfully request reconsideration and withdrawal of the rejection.

Gillich is directed to an aluminum reflector which has a composite reflectivity-enhancing layer with an LI and an HI layer, either of which may be sol-gel derived. Gillich teaches that the reflector body is a metal, preferably aluminum or an aluminum alloy (col. 3, lines 1-3). The LI layer may be a sol-gel layer comprising silicon oxide, aluminum oxide or an oxide of a transition metal, or may be formed by anodizing, an electrolytic treatment in which an oxide film is formed on a surface of a metal. However, the Gillich patent is not enabled because Gillich does not describe enough experimental details, such as components of the coating solution or heating times and temperatures, to allow one of ordinary skill in the art to prepare these layers without undue experimentation (M.P.E.P § 2164). Therefore, the Gillich reference is not an appropriate § 102(e) reference. However, even if, *arguendo*, Gillich were sufficiently enabled to be an appropriately cited reference, Gillich would still not teach or suggest all of the claimed elements or inherently achieve the invention for the following reasons.

The Examiner argues that Gillich teaches sol-gel derived niobium oxide layers which would inherently have the claimed index of refraction of greater than about 1.90. However, applicants' invention is not merely directed to the use of sol-gel technology to apply niobium oxide layers, but rather to sol-gel derived niobium oxide layers which exhibit refractive indices greater than about 1.90 and which can be cured at temperatures sufficiently low (< 150 °C) to be used on substrates such as plastics as has been explained in the record several times. Applicants are unaware of sol-gel-derived, high refractive index niobium oxide layers prior to applicants' invention (specification at page 4, lines 25-26). Since applicants' coating can be cured at low temperatures, it can be used for coating low-melting substrates, such as plastic, while still maintaining a high enough refractive index to be used as an "H" layer in a multilayer antireflection coating.

As described in Example 1 of the present application, the claimed niobium oxide film is formed, for example, from a niobium oxide precursor solution that is prepared by adding $NbCl_5$ to ethanol, adding ethanol and water, and diluting with additional ethanol. Coating conditions, drawing speeds and heat treatment times and temperatures are described in detail in the specification. In contrast, Gillich simply teaches in col. 4, lines 43 - 49 that, "alkoxides and halogen-silanes are mixed and hydrolised and condensed in the presence of water and suitable catalysts. After removing the water and the solvent, a sol forms and may be deposited on the surface to be coated by immersion, centrifugal means, spraying, etc., whereby the sol transforms into a gel film e.g. under the influence of temperature and/or radiation." No specific details, such as solution preparation or curing temperature, are provided by Gillich regarding the sol-gel process, including the Examples.

Further, the only HI value taught by Gillich is 2.5, which is the refractive index of a layer that is essentially titanium oxide (col. 4, line 1); Gillich does not teach the refractive index of a niobium oxide layer. It is known that the conditions used for forming sol-gel derived layers can have a profound effect on the properties of the resulting coatings and, as previously explained, applicants are unaware of sol-gel-derived high refractive index niobium oxide layers prior to applicants' invention. While the Examiner takes the position the sol-gel layer of Gillich would inherently achieve an index of at least about 1.90, the Examiner has not met her burden in this regard. In order to establish that the layers of Gillich would inherently have the claimed refractive index of greater than about 1.90, the Examiner must show that the missing element necessarily flows from the teaching of the reference. In re Rijckaert, 9 F.3d 1531, 1534, 28 U.S.P.Q. 2d 1955 (Fed. Cir. 1993); In re Oelrich , 666 F.2d 568, 581, 212 U.S.P.Q. 323 (CCPA 1981). In the present case, Gillich does not describe the conditions used to prepare the sol-gel layers in that reference.

The Examiner has not shown why the layers of Gillich would inherently and necessarily have a refractive index greater than about 1.90. Consequently, the Examiner has not met her burden of showing inherency and the §102 rejection is improper.

Several aspects of the dependent claims are also not taught or suggested by Gillich. For example, claim 2 recites that the niobium oxide layer is a low temperature cured layer. Gillich does not teach a curing temperature, and thus does not even suggest a low temperature cure. Additionally, claims 11 and 19 recite that the melting point of the substrate is less than or equal to about 450 °C. In contrast, the melting point of the preferred reflective body of Gillich, aluminum, is 660 °C. Gillich specifically teaches the use of aluminum or aluminum alloys as substrates, and thus teaches away from the claimed substrates having low melting points.

Finally, regarding claims 12 and 19, the Examiner argues that the LI layer of Gillich is a sol-gel layer which may contain a mixture of silicon oxide, aluminum oxide and a transition metal oxide, which would have a refractive index of approximately 1.55-1.65. However, Gillich teaches in col. 8, lines 20-21 that this refractive index range is for an aluminum oxide layer and does not teach or suggest the refractive index of a layer containing a mixture of the oxides as claimed. In contrast with the LI layer of Gillich, the layer of claims 12 and 19 which comprise silicon oxide, aluminum oxide and niobium oxide is not a low index layer. Because transition metals are known to increase the refractive index of a film, they are not included in applicants' "L" layers. Rather, the claimed combination of oxides results in a medium index of refraction ("M") layer having a refractive index of about 1.60 to about 1.90. Because Gillich only teaches an LI layer and separately a refractive index of 1.55 to 1.65, Gillich does not teach or suggest the claimed layer exhibiting a middle refractive index of about 1.60 to about 1.90.

For all of these reasons, applicants respectfully submit that Gillich does not teach all of the elements of the pending claims, and reconsideration and withdrawal of the §102(e) rejection are respectfully requested.

In view of the foregoing remarks, applicants respectfully submit that all of the pending claims are patentable, distinct from the cited prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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7/24/02
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